DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Frequently Asked Questions

CYANOBACTERIA

What are CYANOBACTERIA?

Cyanobacteria are a group of aquatic organisms officially classified as bacteria, but they display characteristics of algae and bacteria. Cyanobacteria produce their own nutrients via photosynthesis. The color of the chlorophyll required for this process produces the coloration that has led to their nickname, blue-green algae.

Cyanobacteria naturally occur worldwide, including water bodies in Delaware. Issues arise when conditions of light, temperature and nutrient conditions combine to form an environment conducive to an algal bloom. Large algal blooms can occur rapidly, causing water to change color and algal material to accumulate on the surface. The type of algae or other organism involved varies by location and season. Blooms of cyanobacteria are more likely to occur during summer months than at other times of the year.

How can I be exposed to cyanobacteria?

Inhalation and ingestion are the most common human routes of exposure to cyanobacteria. Drinking water contaminated with high levels of cyanobacteria can lead to health effects. Exposure via inhalation and ingestion can occur while bathing or during recreational water use. Skin contact with contaminated water and vegetative material on the water surface should also be considered a potential route of exposure.

What are the concerns?

Cyanobacteria produce toxins that affect various parts of the body. Different species produce toxins that damage the liver (hepatotoxins) and affect the central nervous system (neurotoxins); and produce toxic alkaloids that affect the renal system and gastrointestinal tract.

Symptoms of exposure to cyanobacteria vary with route of exposure but may include skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth, and liver damage. Swimmers in water containing cyanobacterial toxins may suffer allergic reactions, such as asthma, eye irritation, rashes, and blisters around the mouth and nose.

How can I prevent exposure?

The most important step in preventing potential health effects from exposure to cyanobacteria is regularly monitoring surface water for its presence. The Delaware Department of Natural Resources and Environmental Control (DNREC) conducts regular cyanobacteria monitoring. Once DNREC confirm a cyanobacteria bloom, the agency can restrict water use or close the area.

Individuals enjoying recreational water use should limit contact with scum and algae, as well as with water with odors or obvious discolorations. Do not allow pets to drink or play in water with scum or algae, and rinse them well if they enter such water.

What factors limit exposure to cyanobacteria?

The World Health Organization (WHO) offers the following guidelines for exposure to cyanobacteria:

<20,000 cells per milliliter – low risk of adverse health effects
This guideline is based on protection from irritation and allergic reactions rather than more serious health outcomes.

100,000 cells per milliliter – moderate probability of adverse health effects.
This guideline is based on the potential for health effects via inhalation and ingestion pathways. Concentrations at this level are more likely to contribute to the formation of scum on the water surface.

Water containing scum – high probability of severe health effects. There are cases of animal deaths due to consuming water containing scum. Humans are less likely to consume large amounts of this water because of aesthetic concerns. However, the potential for health effects exists in the case of accidental consumption or inhalation.

As with most health recommendations, children, pregnant women and people with other underlying health problems should take additional precautions even at the lower levels of cyanobacteria.

Activity plays a large part in determining potential exposure:

Level of Exposure	Recreational Activity
High	Swimming, diving, water skiing
Moderate	Canoeing, sailing, rowing
Low to none	Fishing, pleasure cruising, picnicking, hiking

What should I do if exposed to cyanobacteria?

Visit your doctor as soon as possible if you are exposed to cyanobacteria or their toxins.

Sources:

Toxic Cyanobacteria in Water: A Guide to their Public Health Consequences, Monitoring and Management, World Health Organization, 1999, http://www.who.int/water_sanitation_health/resourcesquality/toxcyanbegin.pdf

Guidance for Local Health Departments – Wisconsin Division of Public Health http://dhs.wisconsin.gov/eh/Water/fs/CyanobacteriaLHD.pdf

Public Health Advisory Guidance for Toxigenic Cyanobacteria in Recreational Waters – Oregon Department of Human Services, http://www.oregon.gov/DHS/ph/envtox/docs/bgadecisioncriteria.doc